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# How is chronic non-communicable respiratory conditions research reported in European newspapers? An impact assessment for policy

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## Abstract

**Background:** Newspapers are an important means for the communication of medical research findings to policy-makers and the public, but may distort their views on the relative importance of research into, and burden from, different respiratory diseases.

**Methods:** A systematic search strategy based on respiratory-related keywords was developed and translated into 15 European languages to identify relevant stories in 26 newspapers from eight countries in 2002–2013. Details of the stories were recorded on Excel and coded based on the reported respiratory conditions (asthma, chronic obstructive pulmonary disease (COPD) and other) and research types. Each cited research study was identified on the Web of Science and downloaded for analysis.

**Findings:** There were far more stories about asthma than on COPD, although the amount of research was only modestly greater, and the disease burden far less. Epidemiology, lifestyle and genetics research received the most media attention but not in all newspapers, while means of diagnosis and quality of life were under-reported in all newspapers. Journalists tended to over-cite research from their country by a factor averaging four times more than other researchers. About 10% of stories included a quote from a commentator, especially those in the two UK newspapers, with most of the quotes from UK charities.

**Conclusions:** The balance between disease areas reported in European newspaper stories is very misleading. European policy-makers and public may perceive asthma as more burdensome than it is and COPD much less. The study also showed that UK charities, but not those in other European countries, gained significant publicity from their contributions to these stories.

## KEYWORDS

asthma, chronic obstructive pulmonary disease, newspapers, research impact, respiratory diseases

## 1 | BACKGROUND

Respiratory conditions are a neglected area of research<sup>1–4</sup> with about 4.3% of biomedical funding allocation within the European Union's (EU) seventh Framework Programme for Research and Technological Development (FP7).<sup>2</sup> They are underfunded across Europe in general<sup>3</sup> and account only for 2.5%–4.5% of total medical research spending by UK

funding bodies.<sup>4</sup> Research on these diseases represented only 0.77% of all biomedical research in Europe in 2002–2013 and 0.55% in the world<sup>3</sup>.

The burden of non-communicable respiratory diseases across Europe (EUR31; the 28 European Union Member States, plus Iceland, Norway and Switzerland) in 2012, averaged 5.1% of all Disability Adjusted Life Years (DALYs) as estimated by the World Health Organization.<sup>5</sup> The burden varied between

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**TABLE 1** The number of deaths at the global and European level and the contribution of the various respiratory diseases according to the WHO<sup>9</sup>

	World (000's)	% RESPI, world	EUR31 (000's)	% RESPI, EUR31
<i>Respiratory diseases</i>	4,036		374	
COPD	3,025	74.9	234	62.5
Asthma	287	7.2	36	9.7
Other respiratory	724	17.9	104	27.8

2.1% in Estonia and 7.7% in the UK.<sup>5</sup> Chronic obstructive pulmonary disease (COPD) caused almost two-thirds of the burden (2.9% on average) compared with just 1.0% for asthma; however, the latter received more attention from researchers.<sup>2</sup>

Across Europe, an estimated 30 million children and adults under the age of 45 years have asthma and its prevalence, for both groups, has increased in most European countries.<sup>6</sup> In the UK, there are 8 million people diagnosed with asthma of which an estimated 5.4 million currently receive treatment.<sup>7</sup> The UK and Ireland have among the highest European asthma rates.<sup>6</sup> Pharmacological treatments for asthma, which include bronchodilators and steroids (inhalers or spacers), provide good management of asthmatic attacks and the underlying inflammation and control of their symptoms.<sup>8</sup> Deaths due to asthma, therefore account for only 7% of respiratory deaths at the global level, and 10% in Europe<sup>9</sup> (see Table 1) and the burden from the condition has gone down in consequence.

The prevalence of COPD also varies widely between European countries due to heterogeneity of diagnostic criteria and methods.<sup>10–12</sup> It is estimated that 1.2 million people live with diagnosed COPD in the UK<sup>13</sup> and it is twice as prevalent in males as in females.<sup>14</sup> Because of the lack of effective treatments to control the progress of the disease,<sup>12</sup> COPD accounts for 75% of respiratory disease deaths globally and 62% in Europe<sup>9</sup> (Table 1). COPD is exacerbated by smoking, and by air pollution, and the WHO estimates of mortality (persons, all ages, thousands) from all respiratory diseases are provided in Table 1.<sup>9</sup>

Previous research evaluated the impact of research papers in five NCDs from 2002 to 2013 on national health advisory committees<sup>1</sup> and found that less than 2% of research output was on respiratory medicine, with the exception of the Netherlands. A second measure of impact, namely the effect on European clinical guidelines of chronic respiratory conditions' research in Europe was reported recently<sup>3</sup> demonstrating that the UK and Denmark particularly were influencing the evidence base on clinical guideline recommendations for both asthma and chronic obstructive pulmonary disease (COPD). In this paper, a third measure of impact is described, namely the extent to which respiratory disease research is reported in European newspapers.

Media reporting of medical and scientific findings is a widely recognised means of communication and provision of information to the public<sup>15,16</sup> and health professionals<sup>16,17</sup> that shapes public opinion and influences the policy agenda.<sup>18,19</sup> There have been many studies on newspaper and other mass media reports of medical research and the evaluation of bias against negative findings, public influence, persuasion or framing of public-health policy-formation.<sup>15–19</sup> However, they are often limited to a single country.<sup>16,18,19</sup> This study differs because it is a pan-European effort to determine the disease areas and research types in the field of respiratory conditions.

In this research paper, we have explored the research hypothesis that the amount of respiratory research reported in the newspapers of the reflected sub-diseases would respond to the relative disease burden of each country and/or its research output. We have investigated which countries' research has been most frequently cited in the newspaper stories, and the extent to which journalists have tended to over-cite research from their own country. We have also looked at the research domains, or types, such as epidemiology, genetics and pharmaceutical treatments, that the journalists have selected for their stories.

## 2 | METHODS

### 2.1 | Selection of newspapers

Newspapers were originally selected to represent both right and left wing perspectives in each country. However, due to time limitations, we restricted our analyses to those with the greatest circulation. We assembled a multi-national team of bilingual researchers to help us collect the data. The members of the team were trained at KCL by EP to ensure consistent use of methodology and coding of the disease areas and research domains (see Acknowledgements). Table 2 lists the newspapers and countries from which the respiratory disease research stories were taken.

### 2.2 | Processing of newspaper stories

A systematic search strategy was developed to identify relevant stories reporting research in respiratory diseases in the selected

**TABLE 2** The newspapers and articles on respiratory diseases in the eight European countries on respiratory diseases ranked by the number of relevant stories

Country ISO code	No of newspapers	Newspaper	Language	Stories	AST	COP	OTH
UK	2	<i>Daily Mail; the Guardian</i>	English	180	114	10	56
BE	2	<i>De Standaard; Le Soir</i>	Flemish and French	61	45	10	6
DK	1	<i>Morgenavisen Jyllands Posten</i>	Danish	53	41	9	3
NL	2	<i>De Telegraaf; Het Algemeen Dagblad</i>	Dutch	36	34	2	0
IT	1	<i>La Repubblica</i>	Italian	27	17	3	7
GR	1	<i>To Bήμα (To Vema)</i>	Greek	24	15	2	7
RO	1	<i>Adevarul</i>	Romanian	24	19	2	3
ES	3	<i>El País; El Mundo; ABC</i>	Spanish	22	10	2	10
Total	13			427	295	40	92

BE, Belgium; DK, Denmark; ES, Spain; GR, Greece; IT, Italy; NL, the Netherlands; RO, Romania; UK, United Kingdom.

AST, asthma; COP, chronic obstructive pulmonary disease; CYF, cystic fibrosis; OTH, other respiratory conditions.

European newspapers, either with Factiva © Dow Jones, or the newspapers' own archives. The strategy was as follows:

*(Asthma or COPD or chronic obstructive pulmonary disease or allergic rhinitis or cystic fibrosis or emphysema) and (research\* or study or scientists or expert\*)*

The search statement was translated from English into 15 different languages, of which nine were used for the main EU8 results of this paper (see Table 2). The researchers recorded salient data from the relevant stories on an Excel database and included the date, newspaper, headline and synopsis in both the original language and in English, the journalist's name and position, details of the cited research (if available) for example the scientists' names and their institution, and the journal in which the paper was published. The names and affiliations of any commentators were also recorded.

## 2.3 | Identification and analysis of selected research articles

We identified the details of the cited papers from the Web of Science © Clarivate Analytics (WoS) and then downloaded full bibliographic details as individual text files. We converted these to an Excel spreadsheet by means of a special VBA program developed for this purpose by Dr Philip Roe of Evalua-metrics Ltd. We copied the details of the individual papers across to the main spreadsheet of stories and analysed the papers using further VBA programs. We calculated the fractional counts of countries among the addresses on each paper and classified each paper's research level on a scale from 1.0 = clinical to 4.0 = basic, based on words in their titles and

the journals in which they were published.<sup>20</sup> The researchers using their judgement also coded the research domain (eg, epidemiology, genetics, nutrition) and respiratory disease (asthma, COPD, cystic fibrosis and others) based on the study title, headline and the synopsis of the reported story. Finally, we listed the names and organisations of any commentators who were quoted as this was considered to be intentional to put the significance of the results into context.

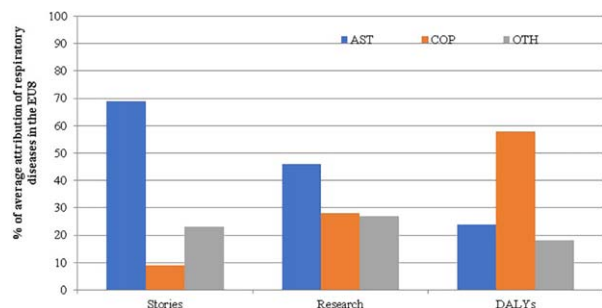
## 2.4 | Statistical analyses

Our analysis covered the types of respiratory conditions as reported in the newspapers for each country—namely asthma, COPD, cystic fibrosis and other—and were compared to the amount of research and the disease burden. For this purpose, simple dependent *t* tests were performed. We also analysed the research levels of the cited papers, self-citations and citations from other countries, as well as the details of the countries and sectors of the organisations invited to comment. For the cited papers, based on the addresses, the research presence of different countries showed if they were relatively over- or under-cited in the media. For the analysis of individual countries' reporting, we restricted the analysis to those eight countries whose newspapers included at least 20 stories, to reach statistically significant conclusions.

## 3 | RESULTS

### 3.1 | Respiratory diseases

Overall, from 2002 to 2013, there were 522 respiratory disease research stories in 26 newspapers from 19 European



**FIGURE 1** The percentages of newspaper stories, research output in respiratory diseases and DALYs in the various respiratory conditions in eight European countries ranked by the percentage of stories on asthma (AST), followed by COPD (COP) and other respiratory diseases (OTH)

countries. These represented 5.8% of all the newspaper stories on the five NCDs; this percentage compares with respiratory medicine's burden of 7.2% to that of the five NCDs, and its 2.7% share of the EUR31 research output. Figure 1 shows that asthma received 69% of the news coverage, while COPD received barely 10% and other respiratory diseases 23%. Asthma was the subject of 45% of the European research outputs, and accounted for 24% of the respiratory disease burden. But for COPD the situation was reversed, with 28% of the research and 58% of the burden. There were differences between the eight selected countries in the emphasis that they gave to the different diseases, see Table 2. The Netherlands gave most prominence to asthma stories (94%) and Spain the least (45%); for COPD Denmark (17%) and Belgium (16%) had the most coverage, and the UK the least (6%). Compared with these differences, the variations in the amount of research and disease burden for the different countries were quite small. In effect, the overall disconnect between disease reportage and burden was reproduced in all eight countries. The most cited research study (7 times) in the 13 newspapers was on the "Association of duration of television viewing in early childhood with the subsequent development of asthma"<sup>21</sup> published in 2009. This was a UK paper which was reported seven times by newspapers in Belgium, Denmark, the Netherlands, Romania and the United Kingdom. Overall, there was one other paper cited five times, eight papers with four newspaper cites, 14 papers with three citations, 55 papers with two cites and the remaining 326 papers cited only once, suggesting that these research papers had a wide influence across the European media.

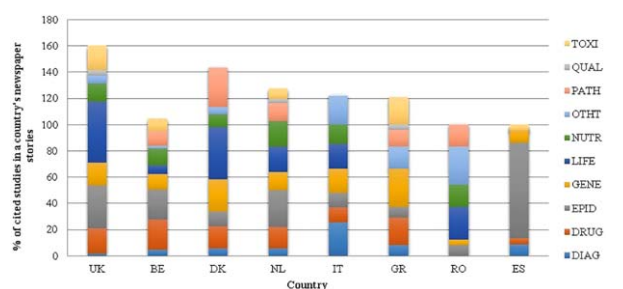
### 3.2 | Research domain

The most frequent of the 10 research domains of the stories were epidemiology (146 stories, 28%) and lifestyle choices (27%) that could lead to respiratory disease. They were followed by genetics (19%), drugs (17%), the effects of diet or nutrition (11%), toxicology (10%), pathology (7%) and other treatments (5%). For the eight countries,

pharmacological treatment research received widespread attention (14% on average) in 11 newspapers (but not Romania), as shown in Figure 2 (orange sections). Italy showed a preference for diagnosis research (25%, blue section) in comparison with the other European countries, while in Spain epidemiology received disproportionate attention. Stories about research on lifestyle (dark blue sections) were most prominent in the British (45%) and Danish (40%) newspapers. Quality of life (violet sections) received no, or very little, attention in the media, with less than 8% in only three countries. Meanwhile, toxicology (yellow sections) as a trigger of a respiratory disease, and pathology (pink sections), which is needed to understand disease progression, were also neglected subjects.

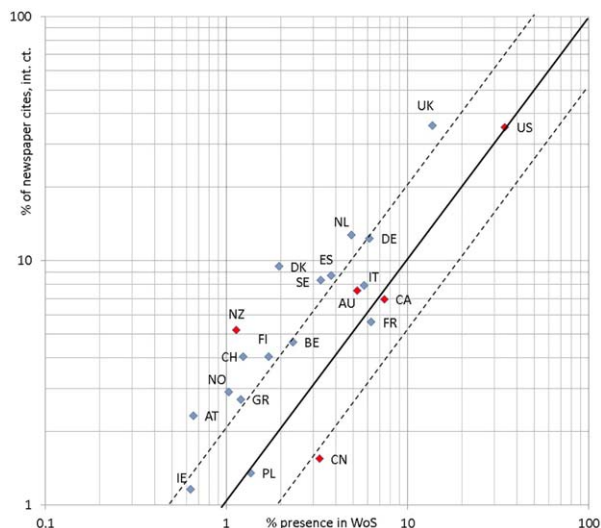
### 3.3 | Countries' research presence and self-citation

As shown in Figure 3, most European countries' research is over-cited in the newspapers compared to their presence in the world literature, particularly that of the Nordic countries. Research from non-European countries such as Korea, China and Asia, as well as non-Anglophone countries, is relatively neglected, as shown in Table 3, even though most of it is published in English. In Table 4, these ratios are presented for papers cited by the newspapers of the eight individual countries (EU8) (but none from Romania). The research reported in the media in the eight European countries is on average four times more cited, often from the journalist's own country, than would be expected based on the country's output in world respiratory research



**FIGURE 2** The percentage country contribution to the cited European newspaper research articles (on a log<sub>10</sub> scale) compared to the world literature on respiratory research. Solid line average trendline, dotted lines: 2× up or 0.5× down average trendline. UK, United Kingdom ( $P < .01$ ); NL, the Netherlands ( $P < .01$ ); ES, Spain (n.s.); DK, Denmark ( $P < .01$ ); SE, Sweden; DE, Germany (n.s.); IT, Italy ( $P < .05$ ); FR, France ( $P < .01$ ); BE, Belgium (n.s.); FI, Finland ( $P < .05$ ); GR, Greece (n.s.); CH, Switzerland (n.s.); DIAG, Diagnosis; DRUG, Pharmacological treatments; EPID, Epidemiology; GENE, Genetics research; LIFE, Lifestyle factors; NUTR, Diet and nutrition; OTH, Other types of treatment; PATH, Pathology; QUAL, Quality of life; TOXI, Toxicology and pollution.





**FIGURE 3** The percentages of respiratory research types for the newspaper stories on respiratory diseases research in eight European countries for 2002–2013 (scale is more than 100%)

(13.3% of the cited articles compared with 4.7% of respiratory research papers).

The countries contributing to the cited papers are shown in Figure 3 as integer counts and plotted against the countries' percentage presence in respiratory disease research in the years 2002–2013, both on log scales. The USA featured most prominently among the cited papers. In Table 4, the over-citation ratios (OCR) are presented for papers cited by the newspapers of the EU8 countries. They tend to cite research by their fellow-countrymen much more than expected. For example, Denmark is over-reporting research in the media, in comparison to what it is producing (research output), by a factor of 27. In contrast, the Romanian newspaper did not cite any Romanian research at all. The OCR for the newspaper citations was also higher than expected from the pattern of citations in the WoS, but the difference was only statistically significant for the UK, Denmark, the Netherlands and Italy.

### 3.4 | Research level

The research level (RL) of papers is much more clinical than that of the journals. With one exception, the newspapers are citing papers of the same mean RL as the generality of research. The RL of the papers averaged 1.35 (compared with 1.46); that of the journals in which they were published averaged 1.82 (compared with 1.76). Therefore, the journalists were selecting both clinical papers and ones in more basic journals: the papers cited by stories about genetics were in journals with RL averaging 2.29. Papers about asthma were in slightly more basic journals (RL  $j$  = 1.77, SEM = 0.039) compared with the much smaller number of COPD papers (RL  $j$  = 1.65, SEM = 0.086).

### 3.5 | Commentators

There were 83 stories from seven newspapers in five of the countries that had at least one commentator: Belgium, Denmark, Greece, the Netherlands and the UK, while stories from Italy, Romania and Spain cited no commentators. These newspaper stories included comments from various researchers or senior members of staff in one or more organisations including charities, universities, hospitals, government bodies and pharmaceutical companies. The combined list of the number of results and commenting organisations is given in Table 5. UK charities are at the top of the list and were quoted in 26 stories, while none of the other organisation types/countries contributed more than nine. The proportion of stories with commentators from the eight European countries are as follows: from the UK 36%, Denmark 30%, the Netherlands 11%, Greece 8% and Belgium 5%.

## 4 | DISCUSSION

This paper examined the reporting of research in respiratory diseases in 13 newspapers from eight European countries for the period 2002–2013, and the degree to which they truly reflect the research efforts in an under-reported research field like chronic non-communicable respiratory conditions. The most significant finding was that there is disproportional reportage of asthma and COPD and within each respiratory

**TABLE 3** The non-European countries' presence in the research papers cited in the eight European countries' newspapers (cites), the percentage presence in world respiratory research from the Web of Science (WoS) and the ratio between them; the expected cited respiratory diseases' research in the eight European countries' newspapers in these non-European countries and the statistical significance

ISO	Cites	Cites, %	WoS, %	Ratio	Expected	P value
US	182	35.14	34.48	1.02	178.6	n.s.
AU	39	7.53	5.27	1.43	27.3	.02
CA	36	6.95	7.42	0.94	38.4	n.s.
NZ	27	5.21	1.13	4.60	5.9	.00
TR	3	0.58	2.01	0.29	10.4	.02
CN	8	1.54	3.26	0.47	16.9	.03
JP	3	0.58	3.99	0.15	20.7	.00
BR	3	0.58	2.44	0.24	12.6	.01
TW	2	0.39	1.11	0.35	5.8	n.s.
KR	1	0.19	2.23	0.09	11.6	.00

Ratios >2 tinted green, >1.41 tinted pale green, <0.5 tinted pink; n.s., non-significant.

**TABLE 4** The percentages of the European countries' presence in the research papers cited in the eight European newspapers, the percentage presence in the world respiratory research from the Web of Science (WoS), the over-citation ratio (OCR), the expected cited respiratory diseases' research in the eight European countries' newspapers in these European countries and the statistical significance in each case

Country ISO	Cites	Own CU	Expected	OCR, NSs	Sign.	OCR, WoS	Exp, WoS	Sign.
UK	180	69.4	21.00	3.30	0.001	1.76	36.99	0.001
BE	61	6	1.12	5.36	0.001	4.38	4.90	n.s.
DK	53	21.3	0.77	27.75	0.001	3.79	2.91	0.001
NL	36	17.9	1.55	11.56	0.001	2.57	3.99	0.001
IT	27	9.3	1.48	6.27	0.001	2.87	4.26	0.001
GR	24	3.05	0.27	11.16	0.001	4.48	1.22	n.s.
ES	22	4.57	0.88	5.17	0.001	3.83	3.38	n.s.

n.s., non-significant.

condition an uneven research attribution in comparison to the disease burden.

#### 4.1 | Respiratory diseases

We found that asthma research is much more frequently reported than COPD research in all eight European countries' newspapers. This finding is robust and demonstrates a substantial press bias that is likely to make it harder to win public and policy support for increased funding for COPD research. Asthma research is more widely reported in newspapers than COPD, although the latter causes a much higher disease burden. This may be that COPD is a less well understood disease area for scientists and consequently for the public, which can explain the lower attention given in the media. This is consistent with previous research indicating that COPD is hugely underdiagnosed,<sup>22</sup> and perhaps this lack of standardised diagnostic measures led to a lack of newspaper coverage. This

pattern may be because COPD primarily affects old men, particularly smokers,<sup>23</sup> and they are perhaps less attractive as subjects for the media. In contrast, of the stories on asthma, 49% involved research on children (including the most cited study<sup>21</sup>). This finding may indicate a form of selection bias and parallels a recent paper that reported that overdiagnosis of childhood asthma is common in UK primary care.<sup>24</sup> The implication of this finding is the potential impact of public influence on future research priorities.

#### 4.2 | Research domain

The research type that received the most attention in the media was pharmaceutical therapies. This re-enforces public perception that medicines are the key to health improvement, rather than efforts to reduce smoking, and improve indoor and outdoor air quality. Diagnosis research in respiratory diseases accounted for fewer than 10% of newspaper stories

**TABLE 5** The list of organisation types, assigned codes and number of reported stories present

Type of organisation	Examples of commentators	N
UK charities	the British Lung Foundation, National Asthma Campaign, National Eczema Society	33
UK non-profits	Action on Smoking and Health, British Thoracic Society	11
Danish universities	Danish Pediatric Asthma Center at the University of Copenhagen	6
Danish charities	Asthma and Allergy Association	4
UK universities	Loughborough Sleep Research Centre	4
UK pharma coys	GSK	3
Belgian universities	Free University Brussels, Liege university	3
Danish pharma coys	ALK-Abello East Jutland Innovation	3
Danish hospitals	Hvidovre Hospital	2

(except in Italy). There is either some form of reporting bias from the media or an underlying preference from Italian, British and Danish scientists to conduct research on respiratory conditions in these areas. For all chronic respiratory diseases research in the EU8, quality of life and toxicology reporting is almost non-existent, in comparison to the great impact that these have on influencing individuals with asthma, COPD, emphysema, cystic fibrosis, other respiratory diseases or overlap with these conditions or other co-morbidities.

#### 4.3 | Countries research presence and self-citation

Besides the USA, the UK was also well cited, but because over one third of the newspaper stories were from the UK, this high percentage presence may be an artefact. Most of the European countries were over-cited relative to their presence in the WoS, but papers from countries in East Asia were almost neglected. The OCR for all these countries was much higher than that expected from their percentage presence in the WoS, especially for the smaller countries.<sup>25</sup> Furthermore, the OCR appears stronger for newspaper stories than for academic articles.

#### 4.4 | Research level

The research level of asthma studies reported in the newspapers is more basic than that of COPD. This contrasts with those cited on clinical practice guidelines,<sup>3</sup> as the papers cited in the newspaper stories were comparable in their research levels to those of European respiratory disease researchers. This means that research is focused on an understanding of this heterogeneous disease by examination of the pathology of the condition or the study of genetic mutations causing its genesis.<sup>26</sup> In comparison, research on COPD is more clinical, both that published in the literature and that reported in the newspaper stories. This is most likely due to concentrated efforts to provide education on COPD detection, management and smoking cessation support services in the clinical context.<sup>12,27</sup> Essentially, an understanding of risk factors such as industrial pollution hazards and smoking is more relevant to this disease. The lack of basic research on COPD may be explained by the difference in the cellular mechanism of COPD pathology, inflammatory reaction and response to treatment that is characteristically different from asthma, leading to the current lack of effective treatments.<sup>28</sup>

#### 4.5 | Commentators

The main finding was that only the two UK newspapers had many commentators, mostly charities or non-profit

organisations which thereby gained exposure. This was seen earlier in a study on the BBC reportage of cancer research.<sup>29</sup> The other newspapers cited academics, while newspapers from three countries invited no comments from any external organisation. Commentators can provide newspaper readers with perspective on the research. They also offer free publicity to universities, charities, hospitals and research centres and may influence research priorities and any subsequent funding.

### 5 | CONCLUSIONS

Media reporting appears to be heavily biased towards asthma, with 70% of stories covering this disease while COPD is under-reported, under-researched and has a disproportionately high disease burden. The media stories on asthma were more basic, particularly focusing on children in comparison to COPD reporting which tended to be more clinical. Diagnosis and quality of life, although greatly influencing the progression of respiratory diseases and their management, were under-reported in all newspapers. On average, about one in nine stories received comments from external organisations, but for the UK newspapers it was one in three. Commentators from charities and other private-non-profit organisations thereby gained publicity for their work in the neglected research area of chronic non-communicable respiratory conditions.

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## CONFLICT OF INTEREST

There was no involvement of the funder in the data collection, analysis, interpretation or any other aspect of the study. This manuscript has been written solely by the three co-authors. None of the authors received any payment for this manuscript and there is no personal, financial or other conflict of interest.

## AUTHOR CONTRIBUTIONS

All three co-authors had full access to all the data in the study and in the final responsibility for the decision to submit to publication.

*Conceived the study design:* Pallari, Lewison

*Performed the literature search and wrote the initial draft of the study:* Pallari

*Identified the data sources (and newspapers) to be examined:* Lewison

*Trained the RAs to collect the data:* Pallari

*Data quality check and performed data analysis and interpretation:* Pallari, Lewison

*Assured overall direction of the project:* Sullivan

## ETHICS

No ethics approval required for this research work.

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